

**Notice of Allowability**

Application No.

10/804,694

Examiner

Gordon J. Stock

Applicant(s)

QUADLING ET AL.

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to interview of 08/29/06.
2. ☒ The allowed claim(s) is/are 1-12;21-31.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All   b) ☐ Some\*   c) ☐ None   of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date 20060829
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

## DETAILED ACTION

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Attorney David Judson on August 29, 2006. See PTOL-413 attached. Specifically, **claims 17-18** will be cancelled to make the previous rejection under 35 U.S.C. 101 and 112 second paragraph moot. And **claims 23-25 and 30** will be amended to overcome the previous rejection under 35 U.S.C 112 second paragraph (see action: 20060720).

The Amended claims are as follows:

17. (cancelled)

18. (cancelled)

23. (currently amended) The intra-oral laser digitizer as described in claim 1 wherein the image optics system comprises an image sensor, ~~an optical element that detects a reflecting surface that captures~~ the reflection of the pattern, and an optics relay coupled to the ~~optical element~~ reflecting surface and configured to relay the reflection of the pattern from the ~~optical element~~ reflecting surface to the image sensor.

24. (currently amended) The intra-oral laser digitizer as described in claim 23 wherein the optics relay coupled to the ~~optical element~~ reflecting surface is co-linear to the optics relay coupled to the scanner.

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25. (currently amended) An intra-oral laser digitizer, comprising:  
a light source having collimating optics configured to generate a collimated beam of light;  
a scanner optically coupled to the light source and configured to scan the collimated beam along at least two axes to generate a pattern comprising a set of segments;  
a first optics relay coupled to the scanner and configured to relay the pattern towards a remote object to be imaged;  
~~an optical element configured to detect~~ a reflecting surface configured to capture a reflection of the pattern from the object at an angle  $\theta$  with respect to the first optics relay; and  
a second optics relay, co-linear to the first optics relay, the second optics relay coupled to the ~~optical element~~ reflecting surface and configured to relay the reflection of the pattern toward an image sensor.

30. (currently amended) An intra-oral laser digitizer, comprising:  
a light source having collimating optics configured to generate a collimated beam of light;  
a scanner optically coupled to the light source and configured to scan the collimated beam along at least two axes;  
a first optics relay coupled to the scanner and configured to relay the scanned collimated beam of light towards a remote object to be imaged, wherein over a given scanning period the scanned collimated beam of light generates a pattern comprising a set of segments;  
an image sensor;  
~~an optical element configured to detect~~ a reflecting surface configured to capture a reflection of the scanned collimated beam from the object at a given triangulation angle  $\theta$ ; and  
a second optics relay, co-linear to the first optics relay, the second optics relay coupled to the ~~optical element~~ reflecting surface and configured to relay the reflection of the scanned collimated beam toward the image sensor, wherein over the given scanning period the reflection of the scanned collimated beam on the image sensor comprises a modified pattern.

*Allowable Subject Matter*

2. **Claims 1-12 and 21-31** are allowed.

The following is an examiner's statement of reasons for allowance:

As to **claim 1**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in an intra-oral laser digitizer system the particular scanner and image optics system, in combination with the rest of the limitations of **claims 1-12, 21-24**.

As to **claim 25**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in an intra-oral laser digitizer the particular scanner, first optics relay, and second optics relay, in combination with the rest of the limitations of **claims 25-29**.

As to **claim 30**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in an intra-oral laser digitizer the particular scanner, first optics relay, and second optics relay, in combination with the rest of the limitations of **claims 30-31**.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

*Conclusion*

3. The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure: U.S. Patent 3,812,505 to Elliott

U.S. Patent 5,424,836 to Weise et al.

U.S. Patent 6,263,234 to Engelhardt et al.

U.S. Patent 6,697,164 to Babayoff et al.

U.S. Patent 6,710,316 to Mandella et al.

U.S. Patent 6,885,464 to Pfeiffer et al.

U.S. Patent 6,977,732 to Chen et al.

***Fax/Telephone Numbers***

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

*Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (571) 273-8300*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

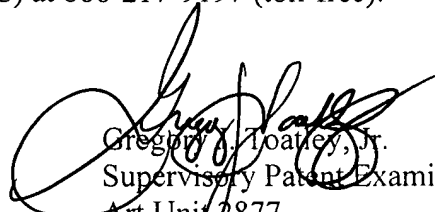
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gs

August 29, 2006

  
Gregory A. Looney, Jr.  
Supervisory Patent Examiner  
Art Unit 2877  
58206